Innovation and the Corporation

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Articles

Innovation and the corporation

*Sally Wheeler**

> *We live in an era of disruption. Think of innovative disruptors like Uber and Airbnb. Disruption is our friend.*[1]
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> *Innovation has become a buzzword that excites socially mobile, inner-city types; but for other Australians, creates anxiety — about job losses and insecurity ... Some old ways of doing things are becoming uncompetitive and obsolete. Disruption and change are inevitable — here and across the global marketplace. Either we acknowledge the change, or we risk being overwhelmed and disadvantaged by it.*[2]

In this article I want to look at the tensions inherent in innovation that Sinodinos identifies above[3] and suggest ways in which corporations might respond to those tensions so as to limit, or at least acknowledge, the pain that their role in innovation might bring to sections of wider society. Unlike the term 'progress' the word 'innovation' whether in supply, product, production or marketing does not necessarily signal 'betterment'. In the first section of the article I examine our current epoch; what has been described since the 1990s as the technological revolution.[4] Riding on the crest of the wave of globaIisation and surviving the GFC with just a temporary blip for the dot com crash in 2003, the technology revolution has brought and will bring more seismic change to the key relationships and identities that underpin human existence such as employer and employee, worker and provider. Concepts such as privacy, friendship and even human attraction[5] are falling to be reconsidered and reconfigured.

Many of the opportunities offered by the technology revolution fall to the corporate sector[6] for commercial exploitation often following a period of

* Head of Law, Queens University Belfast, Ireland.

1 Arthur Sinodinos (then Federal Cabinet Secretary), Editorial, *Daily Telegraph*, 24 May 2016.

2 Arthur Sinodinos (Minister for Industry, Innovation and Science), National Press Club Address (as part of Science Meets Parliament, 22 March 2017).

3 Sinodinos refers to Uber as an 'innovative disrupter'. Disruptive Innovation as opposed to Innovation is claimed as distinct theory. Its leading proponent, Clayton Christensen, expressly disavows Uber as a fulfilling the paradigm of disruptive innovation, see Clayton M Christensen, Michael E Raynor and Rory McDonald, 'What is Disruptive Innovation' (2015) 93 *Harvard Business Review* 44, 44–53, cf Jill Lepore, 'The Disruption Machine: What the gospel of innovation gets wrong', *The New Yorker*, 23 June 2014.

4 See Umberto Colombo, 'The Technology Revolution and the Restructuring of the Global Economy' in Janet H Muroyama and H Guyford (eds), *Globalization of Technology: International Perspectives* (National Academy Press, 1988) 23–31.

5 Brian Earp et al, 'If I Could Just Stop Loving You: Anti-Love Biotechnology and the Ethics of a Chemical Breakup' (2013) 13 *American Journal of Bioethics* 3, 3–17.

6 Of course there are also challenges around the recognition and adoption of technology by corporations. The story is not one of unqualified success. One of the most egregious

considerable state financed support.[7] In addition to providing this financing, there is a responsibility on states to create a regulatory environment that encourages private investment in innovation,[8] offers flexible business forms for the exploitation of innovation and an intellectual property regime that gives sufficient protection for the fruits of innovation.[9] At the level of the individual citizen we might expect the state to support educational and cultural policies that enable and encourage individuals to acquire the necessary skills and maintain their skill base so that they can participate in an innovating economy. There is an obligation on the corporate sector to recognise the power over wider society that it wields as a hugely powerful economic force and take steps to mediate the possible consequences of the exercise of this power.[10] I unashamedly take, as both a starting position and as a given, the idea of the corporation as an actor with societal responsibilities for which it should be held responsible.[11]

In the second section of the article I look at the principles behind responsible innovation ('RI') which is a governance concept derived from the public, as in state or quasi state, governance of science particularly the life sciences in state funded or part state funded institutions such as Universities and public/private partnerships. It currently, like much of the innovation literature, says very little about the position of the corporation and its associated publics. I suggest adapting RI so that it becomes the vehicle by which corporations manage their obligations around the consequences of innovation. The corporate sector has in some senses already accepted this obligation through the adoption of practices such as CSR, sustainability programmes and other voluntary initiatives although I argue, in the third section of the article, that these responses are inadequate both to address the core requirements of RI and the current populist pressures on the corporate

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examples of a failure to adapt to innovation surrounds Kodak and its maintenance of its traditional chemical and physical approach to film in the face of digital photography: Henry C Lucas Jr and Jie Mein Goh, 'Disruptive Technology: How Kodak missed the digital photography revolution' (2009) 18 *Journal of Strategic Information Systems* 46, 46–55.

7 See Mariana Mazzucato, *The Entreprenuerial State: Debunking Public Sector v Private Sector Myths* (Anthem Press, 2015) where the level of state support behind what we commonly think of as purely private sector innovations, eg, GPS, touch screen technology and Google's algorithmic search prowess, is revealed.

8 Of the barriers to innovation identified by Australian firms surveyed as part of the Bankwest Curtin Economics Centre's Innovation Review the most frequently cited was lack of access to funds for development: Bankwest Curtin Economics Centre, *Positioned for an Ideas Boom: Productivity and Innovation in Australia* (March 2016) 45–9 <https://business.curtin.edu.au/wp-content/uploads/sites/5/2016/03/bcec-positioned-for-an-ideas-boom-report.pdf>.

9 States prioritise different policy prescriptions to stimulate and capture innovation, see, eg, Innovation and Science Australia, *Performance Review of the Australian Innovation, Science and Research System* (2016) <https://industry.gov.au/Innovation-and-Science-Australia/Documents/ISA-system-review/index.html>.

10 See, eg, the comments of Gavin Newsom, the lieutenant governor of California, about the corporate responsibility of technology companies to consider the societal consequences of robotic automation: Paul Lewis, 'California's would-be Governor prepares for Battle against Job-killing Robots', *The Guardian*, 5 June 2017, <https://www.theguardian.com/us-news/2017/jun/05/gavin-newsom-governor-election-silicon-valley-robots>.

11 See P Pettit, 'The Conversable, Responsible Corporation' in Eric W Orts and N Craig Smith (eds), *The Moral Responsibility of Firms* (Oxford University Press, 2017) 15–35.

sector. Instead I offer an alternative way forward that is both a more democratic and a more constructive means of engagement for the corporate sector.

Section 1: Opportunities and challenges in the technology revolution

There is a sense in which describing the current period of innovation as the 'technology revolution' is a gross misdescription. Innovation has underpinned and ushered in all previous eras of change; the arrival of steam power and the first wave of mechanised production; electricity which facilitated the era of mass production; the automation of production through the use of electronics and information technology, and the digital revolution which creates blurred lines between physical, digital and biological worlds. There are plenty of subsets of change within this narrative that have required human adaption such as the rise and fall of Fordism and the migration of production to lower cost regulatory regimes under globalisation. There are also many other areas in which we can see technological innovation driving change — for example gunpowder, nuclear weapons and now drones are three revolutions in warfare that have reshaped our ideas about military conflict.

The significance of the current period, whether we see it as the 4th industrial revolution[12] or the fifth Kondratiev wave,[13] is its scale and its speed. The relative 'good life' (things are often good though when viewed through the misty eyed lens of nostalgia) of post WW2 1950s affluence[14] based upon automation was swept away by the pain of globalisation for certain segments of society. However many of those made jobless by the relocation of production activities subsequently found employment in the service sector which expanded expeditiously not least because of the contraction of the space/time dichotomy under the conditions of globalisation; in other words global markets and global production allows for 24–7 consumption which in turn needs to be serviced. Deregulation of many professional occupations and activities together with rampant outsourcing of service provision under neoliberal new public management ideology saw huge growth in earnings potential for lawyers, accountants and management consultants,[15] very steep

12 See Klaus Schwab, *The Fourth Industrial Revolution* (2016) World Economic Forum Geneva (Switzerland). Schwab has the three previous revolutions as steam power, assembly line production and the development of mainframe and personal computing.

13 Schumpeter named the long 45–60 year economic cycles of expansion, stagnation and recession linked to innovation that Kondratiev had identified as Kondratiev waves, in his honour. According to this approach we are in the fifth such wave: steam power; iron railroads and steel; electrical engineering and chemistry; and oil and cars are the four earlier ones. The fifth is computers, software, telecommunications equipment, and, ultimately, biotechnology: Chris Freeman and Francisco Louçñ, *As Time Goes By* (Oxford University Press, 2016).

14 Lawrence R Samuel, *The American Dream: A Cultural History* (Syracuse University Press, 2012) 42ff. Interestingly for the purposes of this paper Samuel describes how in 1949 35 per cent of American teenagers expected to hold 'professional' class jobs even though labour force studies indicated that only 10 per cent of those participating in the economy were employed in this job market segment: at 67ff.

15 David H Autor, 'Why are there still so many jobs? The History and Future of Workplace Automation' (2015) 29 *Journal of Economics Perspective* 3, 5.

rises in corporate profits and the growth of a corporate bonus culture and unchecked remuneration for corporate executives.

What this latest wave of innovation promises is a scaling back of both professional employment and service sector employment opportunities as those functions are taken over by machines. Those who fought back from the disenfranchisement of globalisation into some form of waged employment sense defenestration on an even grander scale and in a much shorter time frame than in previous periods of change. For example in 2003 it was suggested that driving a car through traffic was a task that was not readily automated because the skill level required could not 'be accomplished by machines following explicit programmed rules'.[16] However within 2 years of this claim the first iteration of a driverless car appeared.[17] The disappearance of employment opportunities forms a backdrop to populist disquiet about societal inequality, increasing corporate wealth and declining corporate tax contributions that are seen as inappropriately small. This populist disquiet, as I explain in Section Three of the article, creates a threat to the legitimacy claim that corporations make. The general acceptance of this claim is a necessary requirement of doing business successfully.

There is a major reconfiguration of employment currently underway and this will intensify as the traction of developing artificial intelligence ('AI') systems, advances in robotics[18] and other technology applications increases thus rendering some employment roles redundant and others deskilled.[19] The World Economic Forum singles out white-collar office and administration jobs as the most likely to be lost in the immediate future through automation[20] and disintermediation. Healthcare as an employment sector will be impacted in the future by the development of 'caring robots'.[21] The general service sector faces a similar challenge from robotic developments.[22] In Australia one in 12

16 David H Autor, Frank Levy and Richard J Murnane, 'The Skill Content of Recent Technological Change: An Empirical Exploration' (2003) 118 *Quarterly Journal of Economics* 1279, 1283.

17 This iteration was at Level 1 of the Society of Automotive Engineers International Standard for Automated Driving: Society of Automotive Engineers International, *Automated Driving: Levels of Driving Automation are Defined in New SAE International Standard J3016* <https://www.sae.org/misc/pdfs/automated_driving.pdf>. Numerous manufacturers are now promising to bring a level 4/5 vehicle to market by 2021: Alex Davies, *Everyone Wants a Level 5 Self-driving Car — Here's What That Means* (8 August 2016) Wired <https://www.wired.com/2016/08/self-driving-car-levels-sae-nhtsa/>.

18 For a populist account which pulls together a huge range of contemporary sources, see Martin Ford, *The Rise of the Robots* (Oneworld Publications, 2015).

19 Erik Brynjolfsson and Andrew McAfee, *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies* (W W Norton & Company, 2014).

20 The International Federation of Robotics estimate that 2.5 million robots will be in the workplace by 2019. The annual growth rate in robot sales has been at 15 per cent since 2012: International Federation of Robotics, The Impact of Robots on Productivity, Employment and Jobs (Positioning paper, April 2017) <https://ifr.org/img/office/IFR_The_Impact_of_Robots_on_Employment.pdf>.

21 'Meet our customers — Chiron' on *Innovate UK* (12 April 2016) <https://innovateuk.blog.gov.uk/2016/04/12/meet-our-customers-chiron/>.

22 See World Economic Forum, *The Future of Jobs* <http://reports.weforum.org/future-of-jobs-2016/>.

jobs are located in the manufacturing sector.[23] They have survived globalisation because of the high skill levels embedded in those employees. They will be challenged by the evolution of 3D printing. Despite much emphasis being placed upon job replacement occurring at lower salary levels and particularly in developing economies,[24] even traditional professional roles such as doctors and lawyers[25] will be replaced in part by automated machines for a wide range of tasks that were previously considered core to their professional competencies. AI systems can already infer diagnosis, read x-rays, assess transactional risk and deal with document discovery. They will become more sophisticated and be able to assume more complex tasks. A recent study by the McKinsey Global Institute found that 'currently demonstrated technologies could automate 45% of the activities people are paid to perform'.[26]

The latest predictive evidence available for the technology revolution points not only to the extinction of some employment opportunities and so the creation of a large cohort of unemployed and under employed people but also to wage stagnation and the driving down of wages, particularly for those already in low waged unskilled employment, under conditions of technological advancement.[27] We can take Tesla as an example. Tesla is an energy company that has diversified to manufacture electric cars in a non-unionised car plant in Fremont California.[28] It has developed new battery systems and a pan-US charging network to facilitate its cars. To construct its cars Tesla uses robots maintained and augmented by its human workforce. It aims to make 500 000 cars in 2018, an increase of 495 per cent on its 2016 production figure.[29] Tesla employees earn less per hour than other

23 Committee for Economic Development of Australia, *Australia's Future Workforce* (June 2015) 101.

24 Carl Benedikt Frey and Michael A Osborne, 'The Future of Employment: How Susceptible are Jobs to Computerisation?' (Working Paper No 7, Oxford Martin School, 17 September 2013) and 'World Development Report 2016: Digital Dividends' (Report, World Bank, 2016) <http://www.worldbank.org/en/publication/wdr2016>.

25 Law Society of New South Wales, *The Future of Law and Innovation in the Profession* (2017) 31–45 <http://www.lawsociety.com.au/ForSolictors/Education/ThoughtLeadership/flip/index.htm>.

26 James Manyika et al, *Harnessing Automation for a Future that Works* (2017) McKinsey and Co <http://www.mckinsey.com/global-themes/digital-disruption/harnessing-automation-for-a-future-that-works>.

27 Daron Acemoglu and Pascual Restrepo, 'Robots and Jobs: Evidence from US Labour Markets' (NBER Working Paper No 23285, 2017). They offer the suggestion that one additional robot in industry per 1000 workers reduces wages across the economy by 0.5 per cent.

28 There is a counter narrative to this and Tesla is used to illustrate that as well. It is that the advent of robotic manufacturing means an end to labour cost arbitrage; robots will replace low cost workers and production will move back to sites of consumption thus lowering transportation costs. Livesey presents a fascinating account of the possibilities for this but there is nothing appearing yet in the relevant economic data to suggest that this will become a trend. Tesla is building on its energy background and novelty in construction location plays well for a new product to shake up years of petro-diesel dominance from better known manufacturers such as GM: Finbarr Livesey, *From Global to Local: the Making of Things and the End of Globalisation* (Profile Books, 2017).

29 Julia Carrie Wong, 'Tesla factory workers reveal pain, injury and stress: "Everything feels like the future but us"', *The Guardian*, 18 May 2017, <https://www.theguardian.

manufacturing workers in the same locality and work under considerable time and physical pressure to keep pace with their robotic co-workers while Tesla has a market capitalisation of more than USD50 billion.[30]

Technological developments are profoundly changing our understanding of what is and what will be the function and nature of employment. It is likely that several part-time jobs will be required to assemble a living wage in parts of the economy. The nature of the skills required to get and keep a job are in constant flux. Bauman in his discussion of the move from a production society to a consumer society under the conditions of globalisation and migration talks of the 'redundant worker' and 'human waste'.[31] The 'redundant worker' is one that is judged to be unneeded by the current standards of usefulness; a person that can be done without. Something that is redundant is also something that belongs in the category of 'refuse' or 'waste' and so these people become 'wasted humans'. Bauman's concepts have considerable traction still in the era of swift technological innovation. Just as he described a society plotted across a mobility spectrum from tourists possessing the freedom to move at will and to vagabonds wishing to relocate to sites of affluence but being excluded,[32] the technology society will be plotted across a spectrum from those with transferable or developing skills able to take advantage of emerging opportunities to those who are replaced by robots and AI systems. Being 'redundant' has not only a financial connotation for individuals and wider society but also a huge social impact on those who are 'redundant'. Work is a source of dignity and self-esteem for many, deprived of this people become socially homeless. Irresponsible innovation risks removing part of life's fabric with consequent pain and disruption for those affected.

Kurt Vonnegut's *Player Piano*[33] not only seems particular prophetic and apt at a distance of some 65 years but only sums up the ambivalence of professional society[34] towards our current state. For those yet to become redundant in Bauman's terms, applications of technology which involve competitive advantage through information asymmetry, for example Uber and Deliveroo, are attractive. They offer transport and sustenance flexibility that did not exist before and, unless one is affected by their socially undesireable outsourcing of risk through the use of a business model which creates new

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com/technology/2017/may/18/tesla-workers-factory-conditions-elon-musk>. See also this description of robot automated car plants in Alabama: Peter Waldman, 'Inside Alabama's Auto Jobs Boom: Cheap Wages, Little Training, Crushed Limbs', *Bloomberg*, 23 March 2017, <https://www.bloomberg.com/news/features/2017-03-23/inside-alabama-s-auto-jobs-boom-cheap-wages-little-training-crushed-limbs>.

30 Joe Moran, *Time for Tesla to Listen*, (3 February 2017) Medium <https://medium.com/@moran2017j/time-for-tesla-to-listen-ab5c6259fc88>.

31 Zygmunt Bauman, *Wasted Lives: Modernity and its Outcasts* (Polity Press, 2004) 9–17.

32 Abby Peterson, 'The Use-Value of Human Waste and the Currency of Waste-Disposal Sites in Liquid Modernity' in M Davis and K Tester (eds), *Bauman's Challenge* (Palgrave MacMillan, 2010) 13–36.

33 Kurt Vonnegut, *Player Piano* (Delacorte Press, 1952). See also Ruzbeh Babaee et al, 'The Tyranny of Cybernetics in Kurt Vonnegut's *Player Piano*' (2014) 3 *International Journal of Applied Linguistics and English Literature* 195, 195–201.

34 David Seed, 'Mankind vs Machines: The Technological Dystopia in Kurt Vonnegut's *Player Piano'* in Derek Littlewood and Peter Stockwell (eds), *Impossibility Fiction: Alternativity — Extrapolation — Speculation* (Rodopi, 1996) 11–24.

categories of the self-employed worker, they are potentially efficient options which support a busy urban existence. There is much that is attractive in proposed technological solutions to grand challenges and wicked problems[35] such as climate change and hunger,[36] not least the amelioration of the social discomfort and unrest they will cause if not checked.

However there is also much to fear on the technological journey even for those of us that see ourselves as part of it. Emerging technologies such GM food and genetic engineering engender fear provoked by feelings of loss be that loss of control, income, identity or power. Airbnb, a much less emotive subject than GM food, threatens to restructure the conventional rental market to the detriment of would be long-term tenants. People fear being left behind or excluded.[37] New technologies fall into an institutional void where everyone including many of the innovators themselves are playing catch up.[38] There are few agreed structures or rules to deal with them. Reskilling to be able to take up new generation jobs[39] in areas like computing and green engineering requires employer financial commitment as well as employee desire. Neoliberal governments obsessed by the rhetoric of choice, particularly in a time of austerity, are likely to see this as primarily the role of the corporate sector.

Innovation is not something that happens in a vacuum of passive behaviour. Corporations (in addition to states,[40] obviously, but the focus in this article is on corporations) have choices about which innovations they adopt, how they adopt them and when they adopt them. These decisions have consequences for their employees, their investors and wider society. As Schumpter asserts 'those people [who participate in Creative Destruction] cannot close their ears to the cries of those about to be crushed when the wheels of the new era roll

35 'Wicked' was first used as a descriptor by Rittel and Webber meaning 'malignant' or tricky'. A wicked problem is one that cannot be set out in a contained form with a solution. With wicked problems the definition of the problem is interlinked to the choice of solution. The example used by Rittel and Webber is poverty where the solution might sound in economics, health or education or some combination thereof depending on how the problem of poverty is formulated, see Horst W J Rittell and Melvin M Weber, 'Dilemmas in a General Theory of Planning' (1973) 4 *Policy Sciences* 155, 160–1.

36 The potential power of innovation through collaboration and connection is reviewed in a series of case studies in Philip Auerswald, *The Coming Prosperity: How Entrepreneurs are Transforming the Global Economy* (Oxford University Press, 2012).

37 C Juma *Innovation and its Enemies* (2016) OUP Oxford.

38 Maarten Hajer, 'Policy without Polity? Policy Analysis and the Institutional Void' (2003) 36 *Policy Sciences* 175, 175–95.

39 J Bessen, 'How Computer Automation Affects Occupations: Technology, Jobs, and Skills' (Law and Economics Research paper No 15–49, Boston Univ. School of Law, 3 October 2016) <https://ssrn.com/abstract=2690435>.

40 A potential state solution that ameliorates the adverse effect on employment and wages is the provision of a universal basic income. This idea is currently being discussed in a number of states with Finland in the midst of a trial: Kate McFarland, Finland: First Results from pilot Study? Not Exactly (10 May 2017) Basic Income Earth Network <http://basicincome.org/news/2017/05/finland-first-results-basic-income-pilot-not-exactly/>. The idea has a long pedigree and was suggested as an antidote to the consequences of automation in the United States in 1964 by a group of distinguished American liberal academic economists and scientists, see the discussion of the Ad Hoc Committee on the Triple Revolution provided by the November issue of that year's *Monthly Review*.

over them'.[41] In Section 2 I look at the idea of *responsible innovation* (or as it is sometimes referred to as *research and responsible innovation*) that has emerged recently from the scientific research community in Universities and EU science governance policy in particular. For the corporate sector this will require bringing new structures or at least, less formally, dialogues and inquiries into new places and levels within the innovation process and forming new partnerships with civil society. I explore these in Section 3.

Section 2: The concept of responsible innovation

The current UN Sustainable Development goals[42] and the top ten emerging technologies of 2016 as identified by the World Economic Forum[43] are listed below. There are few direct synergies between them. Perhaps this should not surprise us. The development goals emerge from the challenges identified and agreed on by states whereas the World Economic Forum is a loose amalgamation of business, academic and political and community leaders.[44] Obviously these bodies do not necessarily share the same agenda.

UN Sustainable Development Goals
No Poverty
Resilient infrastructure, industrialisation and innovation
No hunger
Good health and well-being
Quality education
Gender Equality
Clean Water
Affordable clean energy
Decent work and economic growth
Reduce inequality
Sustainable cities
Responsible consumption and production
Climate Change
Ocean and eco-system conservation

WEF Top Ten Emerging Technologies
Systems Metabolic Engineering
Nanosensors and the Internet of Nanothings
Next Generation Batteries
Blockchain
Two-Dimensional Materials
Autonomous Vehicles
Organs-on-Chips
Perovskite Solar Cells
Open AI Ecosystem
Optogenetics

The point of this comparison, however, is to demonstrate that innovations are often interdependent on each other in that the development of technology in one area might eventually lead to its development and application in another area. If a particular technology stalls in the development process then a raft of as yet unidentified opportunities might be lost. There are no simple

41 Joseph Alois Schumpeter, 'The Economy as a Whole' [7th chapter of the *Theory of Economic Development*, trans U Backhaus] (2002) 9 *Industry and Innovation* 93–145, 116.

42 *Transforming Our World: The 2030 Agenda for Sustainable Development*, 7th sess, Agenda Items 15 and 116, UN Doc A/RES/701/1 (21 October 2015) <http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E>.

43 World Economic Forum, *Top 10 Emerging Technologies of 2016* (June 2016) <http://www3.weforum.org/docs/GAC16_Top10_Emerging_Technologies_2016_report.pdf>.

44 The WEF has attracted some sustained critique as a corporate and elitist vehicle of power: Andrew Marshall, *World Economic Forum: A History and Analysis* (20 January 2015) Transnational Institute <https://www.tni.org/en/article/world-economic-forum-a-history-and-analysis> cf Tore Fougner, 'Corporate Power in World Politics: The Case of the World Economic Forum' (2008) 2 *Journal of International Trade and Diplomacy* 97, 97–134.

solutions to any of the development goals but much innovative technology has unforeseen consequences which may or may not be desirable[45] and dual-use possibilities (innovation which has benefits but could also be used for harmful purposes, for example nuclear fission).[46] The unforeseen consequences problem is particularly pertinent early in the life cycle of new technology. The early stages of development would be the ideal time to limit or at least reshape a technology to avoid social and environmental problems but these effects are often not known or simply unexplored at this time. When they do become known, either through usage or because a technology has become more visible and there has been more engagement around it, it is often too late to reshape it as it has been invested in, both socially and economically.[47]

The establishment of a systematic and inclusive discourse[48] around technological innovations and their possibilities for further development would not solve these issues, but it would lessen the likelihood of entrenched positions occurring and make interventions at an earlier stage more plausible. This discourse would bring focus to issues such as the location of the responsibility to explain risks and the identity of potential beneficiaries. Different groups will have divergent agendas around innovations as they bring different interests to the space; for profit corporations are likely to be focused on economic value and their approach to value creation will not be the same as the primarily social value focused NGOs and 3rd sector organisations. This difference of focus accentuates the need for a value based discourse process.

Innovation has become an open and democratised system[49] with successful innovations often being based on a network of actors and information sources rather than a single author. This reflects the far from linear path that lies behind innovation; multiple business sectors from basic scientific research through finance, production, marketing and retail are required to progress innovative ideas.[50] The rise of social media and the availability of the internet means that information in the innovation space can spread quickly and easily and individuals can collaborate with each other without being physically co-located. Changing patterns of employment mean that many individuals would prefer to work as self-employed or in short-term portfolio careers rather than remain with one employer for their whole working life.[51]

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45 Vincent Blok and Pieter Lemmens, 'The Emerging Concept of Responsible Innovation. Three Reasons Why it is Questionable and Calls for a Radical Transformation of the Concept of Innovation' in Bert-Jaap Koops et al (eds), *Responsible Innovation 2: Concepts, Approaches and Applications of Responsible Innovation* (Springer Heidelberg Publishing, 2015) 19, 28.

46 David Kaiser and Jonathan D Moreno, 'Dual-use Research: Self-censorship is not enough' (2012) 492 *Nature* 345, 345–7.

47 David Collingridge, *The Social Control of Technology* (Palgrave Macmillan, 1981).

48 Alexander Peine and Andrea M Herrmann, 'The sources of use knowledge: Towards integrating the dynamics of technology use and design in the articulation of societal challenges' (2012) 79 *Technological Forecasting and Social Change* 1495, 1495–513.

49 Henry W Chesbrough, *Open Innovation: The New Imperative for Creating and Profiting from Technology* (Harvard Business School Press, 2003).

50 Robert G Lee and Judith Petts, 'Adaptive Governance for Responsible Innovation' in Richard Owen, John Bessant and Maggy Heintz (eds), *Responsible Innovation* (John Wiley & Sons, 2013) 143–64.

51 Linus Dahlander and David M Gann, 'How Open is Innovation' (2010) 39 *Research Policy* 699, 699–709

Firms now set out deliberately to capture innovation from a range of sources outside their own R&D hubs; user generated ideas,[52] ideas banks, employees and the voluntary sector.[53] This involves adopting a model of firm organisation that moves away from traditional hierarchies and leadership chains to one that offers support and focus for ideas.[54] Crowd funding of innovation is becoming popular, as are innovation markets where those offering and requiring innovative solutions can meet. Innovation brokers offer services to link potential innovators to corporations to allow information sharing and development to take place.[55] Complete development within a user community also occurs, for example software such as Linux or Mozilla. However within this open system of innovation corporations are still the largest and most multi-functional actor. They are the most likely vehicle through which life changing technologies reach wider society whether they act as financier, developer or producer or all three.[56] While taking steps to mirror this openness, the corporation is the most obvious place to anchor the idea of dialogues around responsible innovation practices.

Innovation nestles in a basket of regulations that cut across the various stages of practice; clinical trials, product liability regulations, environmental standards and regulations and health safety protections for workers for example. These are essentially state or supra-state interventions that are about the governance of risk and risk management[57] rather than evaluating the innovation proposition against a particular standard or standards. Responsible Innovation ('RI') offers an engagement that is less hierarchical and more inclusive than these structures and is evaluative. RI has its roots in ELSA ('ethical, legal, and social aspects' of emerging sciences and technologies) with other earlier influences being Constructive Technology Assessment[58] and Bioethics.[59] ELSA was a top down concept first introduced in 1994 by the 4th EU Framework Programme[60] as a way of framing these issues in the context of EU funded research, particularly in the area of the life sciences. Other

52 Eric von Hippel, 'Democratizing Innovation: The Evolving Phenomenon of User Innovation' (2009) 1 *International Journal of Innovation Science* 289, 29–40.

53 Sara Holmes and Palie Smart, 'Exploring Open Innovation Practice in Firm-Nonprofit Engagements: A Corporate Social Responsibility Perspective' (2009) 39 *R&D Management* 394, 394–409.

54 Martin W Wallin and Georg von Krogh, 'Organizing for Open Innovation: Focus on the Integration of Knowledge' (2010) 39 *Organizational Dynamics* 145, 145–54.

55 InnoCentive, eg, offers all of these services: see <https://www.innocentive.com/>, as does the.Space Australasia: see <https://iotaustralasia.io/portfolio-view/thespace-australasia/>.

56 Jens Frøslev Christensen, 'Whithering Core Competency for the Large Corporation in an Open Innovation World?' in Henry Chesbrough, Wim Vanhaverbeke and Joel West (eds), *Open Innovation: Researching a New Paradigm* (Oxford University Press, 2006) 35–61.

57 Christian Voegtlin and Aandreas Georg Scherer, 'Responsible Innovation and the Innovation of Responsibility: Governing Sustainable Development in a Globalized World' (2017) 143 *Journal of Business Ethics* 227.

58 Steven M Flipse, Maarten C A van der Sanden and Patricia Osseweijer, 'The Why and How of Enabling the Integration of Social and Ethical Aspects in Research and Development' (2013) 19 *Science and Engineering Ethics* 703, 703–25.

59 Hub Zwart, Landerweerd Laurens and Arjan van Rooij, 'Adapt or Perish? Assessing the Recent Shift in the European Research Funding Arena from "ELSA" to "RRI"' (2014) 10 *Life Sciences, Society and Policy* 1, 1–11.

60 *Decision No 110/94/EC of the European Parliament and of the Council of 26 April 1994 concerning the Fourth Framework Programme of the European Community Activities in the*

national funding councils adopted the label to frame the activities that they wished to see research surrounded by. The focus of ELSA was on bringing the humanities and social science research communities into discussions about scientific and technological research. This is not to say that there have been no dialogue spaces under these processes. There have been some notable ones but they have always been under the direct aegis of government or a government-funded entity.[61] This limits their ambit as genuinely exploratory processes. Both ELSA and CTA are more concerned with a limited number of predefined ethical and societal issues grafted on to scientific or technical research processes[62] to be discussed as possible constraints that need to be assessed or managed than they are with creating dialogue.

Responsible Innovation emerged from a similar governance background to ELSA in that it first appeared in the 7th EU Framework Programme[63] and then again in the 8th,[64] more usually called Horizon 2020. What makes it distinctively different from its predecessors is that it is presented within those frameworks as a concept with which to embrace the possibilities for positive contributions in dealing with the world's wicked problems across the entire innovation process.[65] The focus of RI is on changing the way in which innovation, and the research that underpins it, is executed both in terms of process and outcome so that it achieves a demonstrable environmental and/or social benefit in micro and macro terms assessed and decided upon democratically through a positive process of engagement between all those who are in its affected ambit.[66] This requires the actors involved to take responsibility for the impacts of their work.[67] Von Schomberg, once an academic and now a relatively high profile Science Policy officer at the European Commission and science commentator, is the source of the most

Field of Research and Technological Development and Demonstration (1194 to 1998) [1994] OJ L 126/1 <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A31994D1110>.

61 See the history of public dialogue on emerging science and technology provided in Kathy Sykes and Phil Macnaghten, 'Responsible Innovation — Opening UP Dialogue and Debate' in Owen, Bessant and Heintz, above n 50, 85, 87–94.

62 Asle H Kiran, Nelly Oudshoorn and Peter-Paul Verbeek, 'Beyond Checklists: Toward an Ethical-Constructive Technology Assessment' (2015) 2 *Journal of Responsible Innovation* 5, 5–19.

63 European Commission, *The Commission adopts ex-post evaluation of FP7* (19 January 2016) <http://ec.europa.eu/research/fp7/index_en.cfm>.

64 See <http://ec.europa.eu/programmes/horizon2020/en/>.

65 Hannot Rodrígueza, Erik Fishera and Daan Schuurbiers, 'Integrating science and society in European framework programmes: Trends in project-level solicitations' (2013) 42 *Research Policy* 1126, 1126–37.

66 Sara Helen Wilford, 'What is required of requirements? A first stage process towards developing guidelines for responsible research and innovation' (2015) 45 *SIGCAS Computers and Society* 348, 348–55. Another way of framing this might be to see it as Chadwick and Zwart do as 'responsible promise management'; the art of managing both promises and expectations for society as part of an ongoing process: Ruth Chadwick and Hub Zwart, 'From ELSA to Responsible Research and Promisomics' (2013) 9 *Life Sciences, Society and Policy* 1, 1–3.

67 Bernd Carsten Stahl et al, 'The Empathic Care Robot: A Prototype of Responsible Research and Innovation' (2014) 84 *Technological Forecasting and Social Change* 74, 74–85, where the authors provide a pretty sobering example of a care robot and terminal illness through the medium of a radio play.

widely cited definition of RI. He describes it as a 'transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products (in order to allow a proper embedding of scientific and technological advances in our society)'.[68]

The forward looking nature of RI and its focus on embedding discussion of societal benefits and needs means that is pulling perspectives of care and responsiveness, in a future sense,[69] into innovation design, processes and outcomes. These perspectives are very different from the ones of accountability and risk management that ELSA and CTA centred on.[70] RI requires us to confront questions of motivation, appropriateness and consequence in innovation while at the same time recognising the range of perspectives and identities that broadly based dialogues will expose. Owen et al suggest that to do this effectively we need to see RI as housed in an integrated framework of four dimensions which corporations, as the lead actor in innovation, commit to facilitate. The four dimensions are 'anticipation', reflection', 'responsiveness' and 'deliberation'.[71]

In anticipation mode we might work through the intended and possible unintended impacts of innovation thinking about its resilience and effect on the future research agenda more broadly. The reflection mode encourages consideration of the purpose of innovation and the motivation behind it. These are both cognitive dimensions in a way that responsiveness is not. There is a sense in which these are not new exhortations; commentators have been questioning the link between technology design priorities and social utility for some time.[72] What is different about RI in this context is that these exhortations are going across the whole process and end product — a long way beyond just design principles. The responsiveness trope points to the

68 René von Schomberg, 'Prospects for Technology Assessment in a framework of responsible research and innovation' in Marc Dusseldrop and Richard Beecroft (eds), T*echnikfolgen abschätzen lehren: Bildungspotenziale transdisziplinärer Methoden* (Springer, 2011) 39–61 where von Schomberg makes an impassioned plea for innovation to focus on the 'right impacts' which he sees defined in the *Treaty of the European Union*, art 3; in broad terms balanced economic development around equality, sustainability, social protection, a high level of employment and an increasing standard of living for all. See also René von Schomberg, 'A Vision of Responsible Research and Innovation' in Owen, Bessant and Heintz, above n 50, 51–83.

69 In a piece written several years ago I used the work of Hans Jonas on technology and ethics to ground the idea of unlimited obligation to future generations in circumstances where we cannot know the limit of our actions: Sally Wheeler, 'Climate Change, Hans Jonas and Indirect Investors' (2012) 3 *Journal of Environment and the Human Rights* 92, 92–115.

70 See Jack Stilgoe, Richard Owen and Phil Macnaghten, 'Developing a Framework for Responsible Innovation' (2013) 42 *Research Policy* 1568, 1570 where the authors suggest a revised definition for RI that captures more clearly the idea of future projection of consequence rather than backwards assessment of risk expressed as 'RI means taking care of the future through collective stewardship of science and innovation in the present'.

71 Richard Owen et al, 'A Framework for Responsible Innovation' in Owen, Bessant and Heintz, above n 50, 38–9.

72 See, eg, the preface to D Norman, *Turn Signals are the Racial Expressions of Automobiles* (Diversion Books, 1992) where the author comments that 'modern technology seems to exist solely for its own sake'. Norman, one of the first movers in the human-centered design movement, goes on to set out the credo of user experience.

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range of innovation and its trajectory being informed by what comes from the anticipation and deliberation dimensions. Deliberation is the foil for the other three dimensions. As a process it should ensure that a range of perspectives from a widely drawn group of informants is available. Conclusions may or may not emerge from the process. There will be no attempt to drive through suggestions based on what might be considered by some as smart or desirable policy outcomes[73] but it will instead identify areas of consensus, contestation and competition. The content of these dialogues is structured by the demands of the other dimensions. Section three considers how these dialogue spaces might be opened up.

Section 3: The listening corporation

2016–17 has been a time of global political turmoil not seen since the 1960s — for example waves of strikes and demonstrations in South Africa and Columbia — and unexpected political events such as the United Kingdom's vote to leave the European Union after over 40 years of membership and the election of a political outsider, Donald Trump, as US President. Other European states — Austria, and the Netherlands for example — have flirted with far right political movements in a way that is not unlike the engagement that took place in the early years of the 1930s and there has been a rejection of anything seen as the political hegemony be that right or left — recent national election results in France and the United Kingdom reflect this. Much of this unrest has been fuelled by a populist[74] backlash set against the broad themes of perceived income inequalities,[75] economic insecurity, austerity policies, and value systems that are thought to belong to liberal elites.[76] These value systems are under attack not because of what they contain particularly but because they are seen as belonging to those who have escaped the effects of globalisation and the GFC and are likely to survive the current technology revolution emerging from it with either an increased, or at least not diminished, standard of living and because they signal change. Change for those who are already, or fear that they are about to become, *wasted humans* has to be resisted.

Corporations are caught up in this backlash too. Any accommodations they might have made in the era of globalisation to maintain their social licence[77]

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73 See Scott Hartley, *The Fuzzy and The Techie: Why the Liberal Arts Will Rule the Digital World* (Hartley Global, 2017) 109–39.

74 The operating definition of populist in this setting is taken from Mudde; 'a thin-centred ideology that considers society to be ultimately separated into two homogeneous and antagonistic groups, 'the pure people' and 'the corrupt elite' and which argues that politics should be an expression of the ... (general will) of the people': Cas Mudde, *Populist Radical Right Parties in Europe* (Cambridge University Press, 2007) 23. See also Benjamin Moffitt, *The Global Rise of Populism: Performance, Political Style, and Representation* (Stanford University Press, 2016).

75 Era Dabla-Norris et al, *Causes and Consequences of Income Inequality: A Global Perspective* (International Monetary Fund, 2015).

76 See Ronald Inglehart and Pippa Norris, 'Trump, Brexit, and the Rise of Populism: Economic Have-Nots and Cultural Backlash' (HKS Working Paper No RWP16–026, Harvard Kennedy School, 29 July 2016) <SSRN: https://ssrn.com/abstract=2818659>.

77 See Neil Gunningham, Robert A Kagan and Dorothy Thornton, 'Social Licencse and Environmental Protection: Why Businesses Go Beyond Compliance' (2004) 29 *Law and*

are fast evaporating. They are suffering a serious and sustained challenge to their organisational legitimacy and specifically within that construct, their moral legitimacy.[78] What a challenge to a corporation's moral legitimacy means is that a significant section of society no longer sees the corporation as valuable and important to society beyond its ability to generate profits. Loss of moral legitimacy manifests itself in consumer boycotts, declining product or service sales as support for a corporation is withdrawn and alternative sources of supply are sought, media and popular pressure for conduct investigations and opposition from the same sources to proposed innovations. In this situation corporations lose the field position that gives them the ability to influence their environment[79] in terms of regulatory structures and they expose themselves to potentially lasting reputational damage.

The populist judgment is that the corporate sector is part of the establishment that has caused economic pain through a variety of illegitimate means. Policies of financialisation,[80] subprime lending[81] and the general mis-selling of financial products are seen as evidence of corporate greed. The decisions of individual business executives are thought to be the cause of the GFC[82] and these individuals are vilified as having escaped largely uncensored[83] while others, completely unconnected to the finance industry, bear the brunt of austerity politics.[84] The definitional differences of fraudulent conduct (LIBOR for example) and aggressive business practice or poor decision-making (short-termism for example) are largely lost on a popular audience.[85] In the years following the GFC, financial recovery has seen global index values reinflate to pre-crisis levels and corporate profits increase expeditiously while wages have remained static and social welfare nets have tightened.[86] The attacks of activist shareholders on corporate pay are not just

Social Inquiry 307, 307–41 and John Morrison, *The Social License to Operate: How to Keep Your Organization Legitimate* (Palgrave Macmillan, 2014) for an explanation of this term.

78 Corporations can access, according to organisational legitimacy theory, three forms of legitimacy; pragmatic, cognitive and moral. Of these three, moral legitimacy is the one that requires positive thought and action within society and so it is the one that corporations wish to maintain most: Mark C Suchman, 'Managing Legitimacy: Strategic and institutional approaches' (1995) 20 *Academy of Management Review* 571, 571–610.

79 Brayden G King, Teppo Felin and David A Whetten, 'Finding the organization in organizational theory: A meta-theory of the organization as a social actor' (2010) 21 *Organization Science* 290, 290–305.

80 For a variety of definitions of 'financialization', see Shaun French, Andrew Leyshorn and Thomas Wainwrigh, 'Financialising Space, Spacing Financialization' (2011) 35 *Progress in Human Geography* 798, 800–4.

81 Gary Dymski, Jesus Hernandez and Lisa Mohanty, 'Race, Gender, Power, and the US Subprime Mortgage and Foreclosure Crisis: A Meso Analysis' (2013) 19 *Feminist Economics* 124.

82 Douglas E Schoen, *The End of Authority: How a Loss of Legitimacy and Broken Trust are Endangering Our Future* (Rowman and Littlefield Publishers, 2013) 138–51.

83 Linda McDowell, 'Making a Drama out of a Crisis: Representing Financial Failure, or a Tragedy in Five Acts' (2011) 36 *Transactions of the Institute of British Geographers* 193, 193–205.

84 Robert Goldman and Stephen Papson, *Landscapes of Capital* (Polity Press, 2011) 64–104.

85 Rosa Chan, 'Samsung, Shame, and Corporate Atonement', *Harvard Business Review*, 17 May 2007, <https://hbr.org/2017/05/samsung-shame-and-corporate-atonement>

86 Michael Kitson, Ron Martin and Peter Tyler, 'The Geographies of Austerity' (2011) 4 *Cambridge Journal of Regions, Economy and Society* 289.

about the competition between dividend income and executive compensation, they are also about addressing the threat to corporate legitimacy posed by pay differentials.[87] Strategic avoidance of corporate tax has become an issue for some multinational corporations such as Apple, Google and Amazon[88] (there is also a clear link between these corporations and innovation) and for the global accountancy firms such as PWC, Ernst and Young and KPMG who design avoidance schemes often in consultation with the revenue authorities of the relevant states. Tax evasion and corporate involvement in political corruption revealed by the Panama Papers[89] emphasises the synergy between business and government and has added to the legitimacy crisis.

The Edelman Trust Barometer for 2017[90] provides clear support for these populist views and endorses the sources of discontent. It reports that trust in the four institutions of Government, the media, business and NGOs has declined. Only 37 per cent of those surveyed report trust in CEOs and 29 per cent trust in government. The most cited complaint about business is that innovation is moving too quickly with insufficient time being spent on explaining its context particularly on any downsides that might result from its adoption. This builds on one of the findings of the same survey in 2016;[91] that influence has become inverted; it is no longer about authority and it is instead now exercised on a peer-to-peer basis. This means that corporations need to engage with employees and others through dialogue to move past fear and uncertainty and re-establish legitimacy. This fits exactly with the model of responsible innovation set out in Section 2.

The usual response from the corporate sector to legitimacy crises or to loss of reputation is to use CSR policies to re-establish standing and trust. The choice of focus, design and longevity of corporate social responsibility interventions rests with corporate managers. Strategic CSR interventions allow corporate managers to present a corporation to the external world in a particular way. CSR becomes a form of chiaroscuro;[92] certain practices are pushed forward for scrutiny, awards even, while others are to remain firmly in

87 See Final Report of the Executive Remuneration Working Group (July 2016) <https://www.theinvestmentassociation.org/assets/files/press/2016/ERWG%20Final%20Report%20July%202016.pdf> and Julie Walker, 'Australia should compare CEO and average worker pay like the US and UK', *The Conversation*, 28 September 2016.

88 Nubia Evertson, 'Corporate Tax Avoidance: A Crime of Globalization' (2016) 66 *Crime, Law and Social Change* 199, 199–216. The Australian Taxation Office is currently engaged in an exercise to claw back A$2.9 billion from multinational corporations under tax avoidance legislation: Jamie Freed, *Australia's Tax Avoidance Taskforce set to claw back $2.2 billion from multinationals* (6 April 2017) Thomson Reuters <http://www.reuters.com/article/us-australia-taxavoidance-idUSKBN17805A>.

89 Lawrence J Trautman, 'Following the Money: Lessons from the Panama Papers, Part 1: Tip of the Iceberg' (2017) 121 *Penn State Law Review* 807.

90 See *2017 Edelman Trust Barometer: Global Report*, Edelman <http://www.edelman.com/trust2017/>.

91 See Richard Edelman, *Business and Populism* (4 March 2016), Edelman <http://www.edelman.com/p/6-a-m/business-and-populism/>.

92 Norman Jackson and Pippa Carter, 'Organizational Chiaroscuro: Throwing Light on the Concept of Corporate Governance' (1995) 48 *Human Relations* 875.

the shade.[93] Thus, there is no requirement that there be a link between the activities that caused the loss of legitimacy and trust and the CSR strategy adopted to restore the same.[94] CSR is a top down, often reactive and defensive, intervention that serves as a risk management strategy for the corporation in coping with existing, but also evolving, social pressures.[95] Much of its content is orientated towards achieving measureable global standards, the requirements for which are predictable year on year[96] and attainment of which allows benchmarking against competitors for commercial advantage.[97]

CSR, it seems, is unlikely to deliver legitimacy in circumstances where what is required is a framework for innovation practice that embodies anticipation, reflection, responsiveness and deliberation. CSR does not produce new norms,[98] it does not manage uncertainty[99] and it does not set up proactive dialogues.[100] It is an instrumental practice that reflects the status quo or, in some circumstances, creatively deflects the consequences of the status quo. Responsible innovation needs trust to be created and maintained in a dynamic process of engagement that looks beyond the economic and enhancing the economic to the moral and ethical future. This requires a corporate social responsiveness rather than responsibility; a democratic exchange where corporations move away from their board rooms and managing executives simply imposing their agreed position by means of their greater economic and social power to a situation in which there is an open and critical dialogue. What should result is a position of shared understanding and trust.

Key to creating these democratic exchanges is an idea of inclusion, shape and purpose. On the inclusion point much of the RI literature focuses on stakeholders coming together. Stakeholder is a term that has a rich but

93 John M Conley and Cynthia A Williams, 'Engage, Embed and Embellish: Theory versus Practice in the Corporate Social Responsibility Movement' (2005) 31 *Journal of Corporation Law* 1.

94 Consider, eg, the water v schools controversy in relation to the activities of Coca Cola in Rajasthan, India. See K Ravi Raman, 'Corporate Social Responsibility, Local Livelihood and Human Rights: The Case of *Coca Cola* in India' in K Ravi Raman and Ronnie D Lipschutz (eds), *Corporate Social Responsibility* (Palgrave Macmillan, 2010) 182–200 and Aneel Karnani, 'Corporate Social Responsibility Does Not Avert the Tragedy of the Commons — Case Study: Coca-Cola India' (Working Paper No 1173, Ross School of Business, March 2012).

95 Boris Holzer, *Moralizing the Corporation* (Edward Elgar Publishing, 2010) 94–6.

96 See, eg, Mandira Banerjee, 'India case study: Corporate social responsibility doesn't always work', *Michigan News*, 11 July 2013, <http://www.corporate-responsibility.com.au/>.

97 N Craig Smith, 'Corporate Social Responsibility: Whether or How' (2003) 45 *California Management Review* 52, 52–76.

98 Sophie Pellé and Bernard Reber, 'Responsible Innovation in the Light of Moral Responsibility' (2015) 15 *Journal on Chain and Network Science* 107, 107–17.

99 Chris Groves et al, 'Is there room at the bottom for CSR? Corporate social responsibility and nanotechnology in the UK' (2011) 101 *Journal of Business Ethics* 525, 525–52.

100 These might occur under say the particular processes suggested by a body such as the International Council of Mining and Minerals for relocating settlements but these as processes and as end positions fall far short of the requirements of RI: Richie Howitt and Rebecca Lawrence, 'Indigenous Peoples, Corporate Social Responsibility and the Fragility of the Interpersonal Domain' in Ciaran O'Faircheallaigh and Saleem Ali (eds), *Earth Matters* (Greenleaf Publishing, 2008) 83.

contested history in corporate law. Opposition to it as a nomenclature comes from the descriptive force that the stakeholder literature gives to the term. Stakeholder theory asserts that stakeholder interests are derived from the corporation and so are consequently subsumed into it.[101] Stakeholders in the corporate literature are those that have a stake in the corporation and presumably its success.[102] Stakeholder theory ignores the tensions raised by multiple identities and competing positions. All citizens have an interest (albeit not necessarily a shared one) in innovative practices and products and their possible effects but not all citizens have a position on the success or otherwise of the corporation. Stakeholder has to be clearly used in a much wider descriptive sense in this context, perhaps reverting to its original political usage around the idea of citizen engagement. One suggestion, which also goes to the heart of purpose, is that the inclusion of the word *dialogue* signals the required openness to the position of others[103] and a desire to achieve collective goals as opposed to confrontation inspired by competitive pressure and the pursuit of self-interest.[104]

Parties to dialogues around innovation have to trust each other and this may well mean exposing vulnerabilities and weaknesses. Information that is given out has to be valid and relevant and the dialogue has to be structured and adhere to the promised structure in the sense of meetings, virtual contributions and consultations and decision time frames taking place at agreed times and remaining open for agreed time periods.[105] In terms of what results there may well be differences between different groups and group composition and views may change over time but that merely emphasizes the difference between a one-way dissemination strategy and an effective dialogue. There are obvious asymmetries of power and knowledge between those who represent corporate interests and other dialogue participants and indeed knowledge and understanding may well be stratified across non-corporate participants. Engagement may not take place evenly across the RI process; there may be

101 For a review of the contradictions involved in this position see Sally Wheeler, 'The Corporation and the Anthropocene' in Louis Kotzé (ed), *Environmental Law and Governance for the Anthropocene* 289–307.

102 Stakeholders are variously defined as primary or secondary, normative or derivative and claimants or influencers: Max E Clarkson, 'A Stakeholder Framework for Analyzing and Evaluating Corporate Social Performance' (1995) 20 *Academy of Management Review* 92, 92–117 and John Kaler, 'Morality and Strategy in Stakeholder Identification' (2002) 39 *Journal of Business Ethics* 91, 91–9.

103 A more in depth look at the nature of openness would require engagement with a theory of communication. One suggestion might be Levinas, see the discussion of his work in relation to the corporation in Wheeler, 'The Corporation and the Anthropocene', above n 101. Another might be Etzioni the attraction of whom lies in his position on building cross-community megalogues: Amitai Etzioni, *The New Golden Rule* (Basic Books, 1996). See further Vincent Blok, 'Look who's talking: responsible innovation, the paradox of dialogue and the voice of the other in communication and negotiation processes' (2014) 1 *Journal of Responsible Innovation* 171, 171–190.

104 M Kaptein and R van Tulder, 'Toward Effective Stakeholder Dialogue' (2003) 108 *Business and Society Rev* 203, 208–10. Callon uses the word *dialogic* in a similar way to signal an exploration into uncertainty in contrast to *deliberative* which he sees as indicating aggregation into a collective position: Michel Callon, Pierre Lascoumes and Yannick Barthe, *Acting in an Uncertain World: An Essay on Technical Democracy* (MIT Press, 2009).

105 This is an abbreviation of the preconditions that Kaptein and van Tulder suggest: Kaptein and van Tulder, above n n 104, 211–13.

more stakeholder interest at the idea generation or at the commercialisation stage. Corporations might find that they become ring holders in these situations and that they have to take a proactive and committed role in building dialogue communities to tease out these differences between stakeholders and help maintain their commitment.[106]

Callon et al, when thinking about how to make democracy in a representative political sense in a technical and specialised world, suggested *hybrid forums* where questions from different domains — the ethical, the political, the economic and so on — would be posed and answered by a range of actors from different backgrounds with different skills bound together by their desire to be involved. Some of the most pertinent observations and difficult questions came from those without expert knowledge suggesting that uncertainty or fear of misfortune erodes apprehension of or undue respect of the expert. This plays also into the observation referred to above that popular trust occurs currently only at the level of peer to peer.[107] The corporate sector may take heart that from what we know of stakeholder processes conducted in the not unrelated field of environmental decision-making, intensive processes where stakeholders have access to technical and scientific resources produce results rich in new analysis and ideas.[108]

Concluding thoughts

The corporate sector is always responsible for the business risk-business reward calculation behind innovation in process and product terms. In the latter stages of the innovation journey it may well be the sole bearer of development costs. RI as a practice adds to those costs in a variety of ways. If stakeholder engagement occurs in a meaningful way it takes considerable time and the outcome will not necessarily be a positive one.[109] Relations with existing and potential investors may be disrupted if innovations that have been discussed and consulted upon do not materialise or do not materialise within the stated time frame. Engagement creates the possibility of knowledge leakage and therefore the decrease of competitive advantage.

However we might see these costs as the price of corporate legitimacy as well as the price of successful innovation. We know that concerns come from the uncertainty that surrounds innovation. Questions such as how an innovation is to be managed in relation to unanticipated risks, equitable access to its benefits and transparency about possible hazards and limitations are all questions that of considerable significance for corporate reputation. How corporations handle issues of trust and social justice are core issues for the success of innovation and the legitimacy of corporate actors. RI offers a methodology for fostering a feeling of mutuality and ownership through adoption for innovation.

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106 V Blok, L Hoffmans and E F M Wubben, 'Stakeholder Engagement for Responsible Innovation in the Private Sector: Critical Issues and Management Practices' (2015) 15 *Journal on Chain and Network Science* 147, 147–64.

107 See Callon, Lascoumes, Barthe, above n 104, 18–21, 80–92.

108 Thomas C Beierle, 'The Quality of Stakeholder-Based Decisions' (2002) 22 *Risk Analysis* 739, 739–49.

109 Lee and Petts, above n 50.